

Appl. No. : **10/030,732**
Filed : **January 8, 2002**

REMARKS

Applicants wish to initially thank the Examiner for the courteous interview conducted with their representative on June 22, 2005. As discussed at the interview, Claim 1 has been amended to delete the term "optionally." Claims 1, 2, 8 and 10-14 remain pending in this application. In response to the Office action mailed from the USPTO on February 10, 2005 and further to the filing of an RCE, the claims were amended to more clearly recite the invention as claimed. Claims 15-20 were added. Claim 15 is Claim 11 rewritten in independent form. Claim 16 is Claim 13 written in independent form. Claim 17 has been amended to recite the use of nitrogen alone. Claims 18-20 are Claims 2, 8 and 10 amended to depend upon new process Claim 15. The changes made to the Specification and Claims by the current amendment, including ~~deletions~~ and additions, are shown herein with deletions designated with a strikethrough and additions underlined. No new matter has been added herewith. As a result of the amendment, Claims 1, 2, 8 and 10-20 are presented for further examination.

Rejection under 35 U.S.C. §103(a)

Claims 1, 2, 8, 12 and 14 were rejected as being unpatentable in view of Shapovalov (US 5,181,549) in view of JP-5-59462, and further in view of JP 3-17236 (see IDS of 4/2/02).

Claim 10 has been rejected as obvious in view of Shapovalov (US 5,181,549) in view of JP-5-59462, and further in view of JP 3-17236 (see IDS of 4/2/02) and further in view of JP 3-294437.

The Examiner stated that Shapovalov '549 discloses the method and teaches the use of Hydrogen gas or mixtures thereof (column 4, lines 27-61). JP 5-59462 discloses the step of maintaining the raw metal material under a reduced pressure at a preheating temperature just below the melting point of the metal. The Examiner further stated that neither Shapovalov nor JP 5-59462 discloses the use to nitrogen gas and/or one or more gasses as pressurization gases. However, the Examiner believed that JP 3-17236 discloses a method of manufacturing foamed metal, in which the method includes providing fine gas bubbles uniformly dispersed over the whole of the metal by dissolving a soluble gas such as hydrogen or nitrogen into molten metal (abstract, Figures 1-3).

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With respect to claim 10, the Examiner believed that JP 3-17236 discloses a method and apparatus for manufacturing porous metallic materials, in which the process includes continuously draining slurried porous metal 12 from a drain nozzle 3 to provide continuous casting in the mold below the molten metal 10 in the container, such that the continuously draining/casting of the porous metal is advantageous for continuously obtaining a porous metal product having a wide range of shapes and porosity (abstract; and Figures 1 and 2).

Applicants wish to again thank the Examiner for the courteous interview conducted with their representative on June 22, 2005. As discussed at the interview, Claim 1 has been amended to delete the term "optionally."

In the Office Action mailed February 10, 2005, the Examiner indicated that Claims 11 and 13 were allowable over the art of record. However, Claims 1, 2, 8, 12 and 14 were rejected as obvious over Shapovalov (US 5,181,549) in view of JP 5-59462, and further in view of JP 3-17236. Rejected independent claims 1 and 12 include the subject matter of allowable Claims 11 and 13, and also include the use of a mixture of nitrogen gas and hydrogen. As explained below, this particular mixture provides results that are completely unexpected in light of the prior art. Accordingly, the full subject matter of independent Claims 1 and 12 is allowable over the art of record.

The unexpected results obtained by the use of a mixture of nitrogen and hydrogen in connection with the present invention are detailed in the attached Declaration of Hideo Nakajima. Briefly, two porous copper materials were prepared in accordance with the description of the present invention disclosed in the present specification in connection with Figure 8. One such porous material was prepared using a mixture of hydrogen and argon, while the other porous material was prepared using a mixture of hydrogen and nitrogen. The material prepared using the hydrogen-nitrogen mixture exhibited far greater uniformity of pore diameter and markedly decreased number of minor pores relative to the material prepared using the hydrogen-argon mixture. As a result, the material prepared using the hydrogen-nitrogen mixture would be both more uniform and stronger than the material prepared using the hydrogen-argon mixture.

Nothing in the prior art of record would even remotely suggest that the results reported in the Declaration could be achieved when nitrogen is included in the gas mixture with hydrogen.

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These unexpected results clearly evidence the nonobviousness of the use of a mixture of nitrogen and hydrogen gases in connection with the present invention. Since mixtures of the other gases recited in Claims 1 and 12 have already been acknowledged to be free of the art, the entire scope of Claims 1 and 12 is free of the art. All of the remaining claims depend from either Claim 1 or Claim 12, and are patentable for at least that reason. Accordingly, withdrawal of the rejection is respectfully requested.

Claim 10 was rejected in view of the references discussed above and additionally in view of JP 3-294437. However, Claim 10 depends from allowable Claim 1 and sets forth additional limitations thereover. Accordingly, Claim 10 is also allowable and the rejection of this claim should be withdrawn.

Conclusion

Applicants believe that the current amendments place the application in condition for allowance. Should there be any questions which might result in a delay in allowance, the examiner is respectfully requested to contact the undersigned at the telephone number appearing below. Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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Dated: July 11, 2005

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